4.6 Isosceles Triangle Theorem

ΔABC is isosceles

$\overline{AB} \cong \overline{AC}$

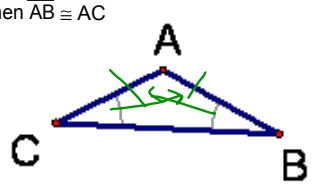
Isosceles Δ Theorem-(Theorem 4.9) If 2 sides of a Δ are ≅, then the angles opposite those sides are ≅. (I Δ thm) (ITT)

Since $\overline{AB} \cong \overline{AC}$, then ∠C ≅ ∠B

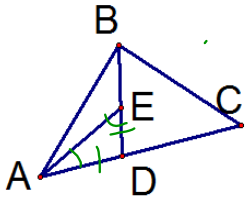
∠A is the vertex angle
∠B and ∠C are the base angles

The Converse of the Isosceles ΔTheorem-(Theorem 4.10) If 2 angles of a Δ are ≅, then the sides opposite those angles are ≅.

Since ∠C ≅ ∠B, then $\overline{AB} \cong \overline{AC}$



Don't Write!

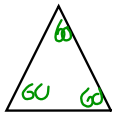


Name two congruent angles...
If $\overline{AB} \cong \overline{BC}$ ∠C ≅ ∠BAD
If $\overline{BE} \cong \overline{AE}$ ∠BAE ≅ ∠EBA
If $\overline{BD} \cong \overline{BC}$ ∠BDC ≅ ∠BCD

Name two congruent segments....
If ∠AED ≅ ∠DAE $\overline{ED} \cong \overline{AD}$

Corollary 4.3-A Δ is equilateral iff it is equiangular

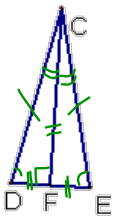
Corollary 4.4-Each angle of an equilateral Δ measures 60°.



*******The altitude of an isosceles △ is ⊥ to the base at its midpoint.**

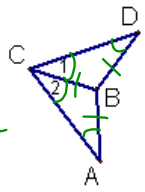
If $\overline{CF}$ is the altitude from the vertex angle, then DF = FE and m∠CFE = 90°

Why? ΔDFC ≅ ΔEFC by HL



Proof Examples:

Given: AB = CB = BD
∠2 ≅ ∠1
Prove: ∠A ≅ ∠D



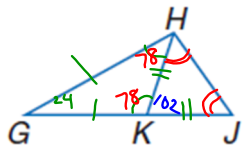
Statements	Reasons
① ~~~	① Given
② ∠2 ≅ ∠A ∠1 ≅ ∠D	② I △ thm
③ ∠A ≅ ∠D	③ Subst.

In the figure, $\overline{GK} \cong \overline{GH}$ and $\overline{HK} \cong \overline{KJ}$.

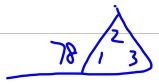
$m\angle G = 24$

$m\angle J =$ 39°

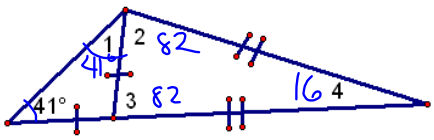
180 − 24 = 156 ÷ 2



78 ÷ 2



Find the measures of the numbered angles.



82 + 82 = 164